Thirdly the expert should be examined by the court and crossed examined by counsel on both sides, within discretion of the court.

And fourthly he should be permitted to estimate the value of evidence, comprehended within his special department, and to reject from consideration that which is essentially false.

This latter privilege is now forbidden to the expert who is alone capable of exercising it, and assigned to the juryman who is, generally, especially incapable.

Lastly the expert in criminal, as in civil, cases should be compensated for his services. It is surely a hardship endured by no other class of men, to be required, at the demand of any attorney who may feel the need of his brains to assist him in building up his own reputation, or any criminal to save his neck from the well merited halter, to give his time, his knowledge, his private property without just compensation, in contravention to the expressed provisions of common law and common justice.

No. 163 State street, March 17, 1876.

Art. V.—A CONTRIBUTION TO THE PATHOLOGY AND THERAPEUTICS OF PERTUSSIS.*

By Seneca D. Powell, M.D., of New York City.

At a meeting of the Northwestern Medical and Surgical Society, on March 17, 1875, I called attention to three of the cases I wish to read to you this evening, and again, on November 17, 1875, I reported to the Society two other cases.

Case I.—November 8, 1874, B. L., aged 6 years, while playing in the street, was run over by a wagon and suffered fracture of the lower third of the humerus. On examining

*Repeated, by request, before the New York Neurological Society, March 6, 1876.

the injured limb, I found difficulty in reducing the dislocation, and retaining the fragments in close apposition; so much so as to compel me to thoroughly anæsthetize the patient for the greater part of an hour. Having adjusted the limb satisfactorily, and while waiting for the effects of the ether to pass away, the child's mother informed me that he was suffering from a severe attack of whooping cough of 3 weeks standing, and expressed fears of a bad result from the anæsthetic. Knowing that the administration of ether is sometimes followed by bronchitis, and fearing also an increase in the severity of the whooping-cough, I adjusted a swing and pully to prevent disturbance of the limb during the night, and also prescribed an anodyne. The next morning I found my patient doing well; and his mother reported that he had passed a good night, and stating that he had not "whooped" at all, though he had coughed once or twice. I felt it to be somewhat singular, but attributed the relief to the shock to the nervous system, and fully expected a recurrence of the whooping. A favorable report being made the following morning, I was at a loss to account for the improvement. In leaning over the arm to arrange the bandage, I detected the odor of ether and though this being nothing unusual the thought presented itself that possibly the anæsthetic was the cause of the disappearance of the hitherto troublesome cough. Determining to try the experiment as soon as a favorable case presented itself, I made note of the fact and waited patiently for an opportunity. Several weeks passed by before I was called to another case of the disease in question, and though there were two cases in the family, I experienced insurmountable objections from the parents to its being used. However, on the 5th of January, 1875, a patient was brought into my office.

CASE II.—A. G., aged 4 years, a well developed, healthy child, otherwise than being sick with whooping-cough of 4 weeks standing. While in the office she had two or three attacks of coughing, followed by a well marked "whoop," and each paroxysm ending with vomiting. Gaining the permission of the mother, I completely anæsthetized the patient, which was continued 40 minutes. After an hour's rest, she

was taken home. The next day I saw her and found that there had been no "whooping," although she had coughed several times during the night. Examination revealed a few bronchial rales. Ordered muriate of ammon. and syr. lobelia. Three days after I saw her again, and found her entirely free from cough and doing well.

CASE III.—February 26, 1875. M. W., aged 6½ years. She had been in the country and was there exposed to and contracted whooping-cough, from which she had suffered six weeks. I have never seen a more marked case of the disease in the paroxysmal stage. She was very much emaciated and feverish, the pulse being 128, and the temperature 101. Eyes blood shot,—the whole conjunctiva being thoroughly injected. With the mothers consent, I put her under the influence of Squibb's sulphuric ether, keeping her well anæsthetized for 50 minutes and using a little over four ounces of ether. After resting an hour I sent her home to the St. Nicholas hotel, where I visited her the next day. She had coughed several times during the night but had whooped only twice. I again anæsthetized her for 20 minutes. The following day I saw her and ascertained that she had not "whooped" at all since my last visit. The bronchitis was trifling and disappeared in three or four days by the use of ammon. muriate and tr. belladonna.

CASE IV.—Reported by Dr. O'Reilly, 303 W. 42d street. J. F., aged 2 years, was brought into my office September 6th, 1875, by his mother who stated that the child had been suffering from whooping-cough during the past nine weeks, and that lately the paroxysms of coughing had increased in frequency and intensity, so that the child could not retain any food on his stomach from constant vomiting. On examination the patient seemed so emaciated that I concluded it was almost useless to do anything. However, recalling to my mind a statement made to me a short time previous by Prof. Little that anæsthesia from ether was one of the new and many suggestions for the relief of whooping-cough, and the mother having consented, I etherized the child and kept him so during the space of 15 minutes.

September 7th: the child is a great deal better, the paroxysms of coughing not being half so frequent, and the vomiting has

entirely ceased. I again kept the patient under ether for 20 minutes.

September 10th: the mother says the child coughed five times in 3 days (72 hours.) To-day I administered the ether 15 minutes. I have not seen the child since, but the mother sent me word about a week afterwards that the cough was gone since the last etherization and the patient cured.

CASE V.—October 15th, 1875, P. C., aged 9 years, came into my office with a well marked attack of whooping-cough in the second stage, and of several weeks standing—the lad could not say how long. Anæsthetized him for 35 minutes. He was to return the next day, but failed to do so and I did not see him until the 18th. He had coughed and whooped a few times. Again anæsthetized him for 15 minutes.

November 3d, reported entirely well.

In calling your attention to the above limited number of cases, I must state that I recognize the fact that one of two courses was open to me, either I should remain quiet and thoroughly try the remedy in my own practice—thus testing its efficacy beyond doubt, or by asking your aid, employ a quicker and better means of determining the truth of my deductions. Neither would I be warranted in recommending such a remedy as sulphuric ether, did not the daily administrations of the drug prove it to be almost entirely harmless and free from danger, when used judiciously, especially upon children. Like small-pox, measles, scarlet-fever, and other acute infectious diseases, whooping-cough is dependant upon some special specific poison, and is thoroughly contagious in its character. It is essentially a nervous disease, generated by a morbific poison thrown off from an affected person and affecting the system through means of the pneumogastric nerves, of those exposed to its influence; and the bronchitis and fever which form the other principal elements, do not enter into its pathology but are the natural results following the poisoning and consequent disturbance of the healthy functions of the system. Death from whooping-cough uncomplicated, is so rare that we lose the advantages to be obtained from post-mortem examinations, and are forced to look to the symptoms almost entirely for our knowledge of

the disease, though there are a few cases on record, and to which I shall allude, wherein the pneumogastric nerves were the seat of well marked morbid anatomical appearances. One of the most prominent symptoms in whooping-cough is the spasmodic character of the coughing, occurring at variable intervals, though sometimes with a periodic regularity, and with the intermissions marked by perfect rest and a healthy performance of the functions. This course is typical of neurotic diseases and is of itself enough to strongly incline the observer to look to the nerves as the seat of the disorder. The rule is in whooping-cough that the number of paroxysms are more numerous in the night than during the day, and this I believe holds good in all or very nearly all neuroses. It is true that we have, from reflex action, paroxysms of coughing similar in many respects to that of whooping-cough, but due to the presence of some irritating substance which to remove is to relieve the cough. Yet, we might look in vain for sufficient cause to produce such disturbance in whooping-cough patients, long before there is sufficient hyperæsthesia of the mucous membranes to account for the coughing spells as the result of reflex action. Were the cough dependent upon hyperæsthesia of the mucous membrane, it seems plausible and rational to think any irritation, provided it be carried to a sufficient extent, would give rise to the same paroxysms.

Whooping-cough may be diagnosed in its earliest stage *by the absence* of any indication of disturbance to any of the mucous membranes sufficient to give rise to the paroxysms.

Females and males approaching nearest to the feminine constitution, are more susceptible to the poison. In other words, the more irritable and nervous your patient, the more apt is he to contract whooping cough, and the more severe will be the attack as a rule. A patient who, when isolated coughs only once in 5 or 6 hours, will, upon being brought into the presence of other cases, develop a sudden accession of the disease, coughing at sight of another in the paroxysm. This can only be because the irritation from the hyperæsthetic mucous membrane becomes greater. It is generally conceded that the "whoop" is characteristic of the disease, though not regarded as such by so good an authority as Dr. Copeland, who states

that he has frequently met with it in acute bronchitis, attended with cough recurring in paroxysms, and also in tubercular degeneration of the bronchial glands. I have no experience of its presence in the former disease, neither have I been able to find it noted by other writers; but I have seen several cases of the latter, wherein there was a harsh sounding or croupy cough with pertussis like paroxysms, but which were very short and without the hissing, crowing, whistling, sipping or stridulous sound met with in whooping-cough; and this is given as one of the diagnostic symptoms of Dr. Condie and others. Even in the severest cases of tuberculization of the bronchial glands in which you find the glands and ganglionic chains throughout the entire system enlarged, you do not find the characteristic "whoop" of whooping-cough in my experience. Though this does not agree with the experience of one of the latest French writers upon the subject.

Dr. De Mussy, of Paris, even looks to the fact of the compression of the branches of the pneumogastric nerves, by tumefied ganglions as quite a satisfactory explanation of whooping-cough respiration. Were this the true cause of the whooping-cough "whoop," we should frequently find it in the different bronchial affections—in syphilitic enlargement of the glands—in the growth of tumors pressing upon the branches of the pneumogastric and nerves with communicating branches, and even in the induration and ganglionic enlargement following an operation about the fauces and larynx. That the "whoop" is the result of an irritation seated either in the larynx and trachea or in the brain, there is little doubt; and from the fact that we cannot produce a similar result by any foreign interference. And also, that the majority of symptoms point to the pneumogastric as the seat of the disease, I am led to look to that nerve as the cause of the disturbance, and the "nucleus" as the seat of irritation, and to explain the "whoop," as caused by spasm of the crico-thyroid muscle, through reflex action transmitted by the accessory branch of the spinal accessory nerve. Laryngismus stridulous, is the only one of all the many diseases we are subject to in which you have any symptom approaching the "whoop" of pertussis, and this symptom is produced by the same anatomical agency

with the probability of its point of irritation being at a different seat. The same diversified opinions are held in regard to the phenomena of this disease, as those of whooping-cough. Dr. Copeland states that from his researches into the pathology of whooping-cough, he was led to consider the medulla oblongata or its membranes very early implicated in this disease, evidences of inflammatory irritation of these parts having been very generally noticed in the post-mortum inspections he had made, and that he conceived that the morbid impression or irritation occasioned by the exciting cause in the upper parts of the respiratory surfaces, particularly the glottis and its vicinity, affects the respiratory nerves, especially the pneumogastric, and that the irritation is extended to the origins of these nerves, where it aggravates and perpetuates the primary affection. I agree with the Dr. partially, but claim that the specific poison coming in contact with the distributing branches of the pneumogastric, infects the nerves and not the mucous membrane or any of the parts surrounding, and the irritation as conveyed directly along the nerve, until its origin is reached, and its "nucleus" involved. The evidences of disease about the fauces and larynx are due to the fact that a diseased nerve cannot perform a healthy function. Drs. Hoffman and Hufeland, both coincide in believing whooping-cough to be due to irritation of the nerves supplying the larynx, air passages, diaphragm and stomach, and to an affection chiefly of the pneumo-gastric nerves. Dr. Webster who was the first to direct attention to the neurotic character of the disease, says that the symptoms when closely viewed, warrant the conviction that whooping-cough depends upon inflammatory irritation of the brain or its membranes, or of both. Later observation has taught us to limit the irritation to the medulla oblongata, that is, provided we look to the nervous centres at all for the trouble.

Dr. Albers, of Bremen, looks upon whooping-cough as a disease of the nerves of the chest, but fails to fix any definite pathology or mode of action. Recognizing the implication of the pneumogastric he limits the trouble to its peripheral branches and says nothing of the symptoms which indicate a more extensive disease.

M. Guibert considers whooping-cough as essentially a nervous disease and refers to the general symptoms as proof of his assertions. It has been the good fortune of some writers upon this subject to examine many anatomical specimens dead from this disease, per se, as well accompanied with some of the many complications. Kilian and Autenreith both speak of the pneumogastric being found red and injected, and the medullary matter of the spinal cord, dense in texture and of cartilaginous firmness.

Clarus, Bauer, Holzhausen, Hufeland, Hoffman and Preschet all speak of the diseased condition of the phrenic nerve, but more especially of the pneumogastric. Dr. Mackintosh states that he has examined the bodies of those who have died of whooping-cough in 50 cases, and found the appearances very uniform, according to the period of the disease at which death took place. Usually marks of vascularity and of venous turgescence were discovered in the head, and sometimes effusion of serum in the ventricles and between the membranes. Dr. Copeland says that "as far as his observations show from his dissections, inflammatory appearances have been observed in the medulla oblongata, or in its membranes, even when no other remarkable lesion was present within the cranium;" and from the numerous post-mortem examinations he has made, he is warranted in stating that most of the lesions observed by writers in this disease are merely effects of the complications of, and diseases excited by this complaint; and that the parts most constantly found altered are the mucuous covering of of the epiglottis, trachea and bronchi; and of the pharynx and œsophagus; and as respects the nervous system, the medulla oblongata and its membranes. Many other writers concur in believing the disease to be strictly a nervous one, and some few give post-mortem examinations as the basis of their belief, but the main points are embodied in the cases named. We must not forget the fact that whooping-cough, of itself, is rarely fatal, and in making post-mortem examinations of patients dead with complicating diseases, the latter very materially obscure observations, to say nothing of the post-mortem changes. The physiological action or effect of the classes of medicines which have given relief in whooping-

cough should not be overlooked in our pathological search, as they also point to a certain extent, to the seat of the disease. Belladonna is an anodyne narcotic with a direct action upon the mouth and throat, causing a peculiar dryness upon these parts. Hyoscyamus is possessed of the same properties and these are looked upon as the sheet-anchor remedies by most practitioners. Hydrocyanic acid, another remedy, is a narcotic and also acts upon the nerves of the throat. Conium, a sedative narcotic exerts a beneficial effect upon the disease. Opium, in its different forms, chloroform, sulphuric ether internally, and chloral hydrate have been the more successful of the many remedies which have been given.

Five cases do not warrant a positive affirmation of the value of etherization in this disease, but they do warrant my calling the attention of the profession to the facts, and asking each and every one to give it at least a fair trial or none at all. My theory is, of course, not demonstrable; still I think the symptoms of the disease, and the experience of others, support it almost conclusively.

Before closing my paper I wish to say that I am a beginner, as you have doubtless perceived, in the difficult fields open to the researches of the practitioners of medicine, and that I ask your opinions and criticisms freely, hoping by such means to attain the goal before all earnest students—a thorough knowledge of the ills of our fellow man.

In the debate which followed:

Dr. Benjamin F. Dawson said that in the treatment of this disease, he has been a great advocate of quinine. Not only he, but others had used it with success and satisfaction. Its use had been recommended because of its destructive qualities to bacteria, sporules, etc., which have been discovered to be present by the aid of the microscope, by Dr. Woodman. Quinine should be given in solution, so that it may "wash down" the mucous membrane of the throat. He had also given chloral, especially at night. He would like Dr. Powell to try his ether treatment in recent cases.

Dr. Porter had met with good results from chloral. He averaged about two weeks in effecting a cure. He has tried the quinine treatment and has met with about the same result.

More recently he has tried the fluid extract of chestnut leaves (Mace's) in doses of about twenty drops. In some cases it cured the patient in one day. The time required to effect a cure is from one day to two weeks.

Dr. J. C. Peters pointed to the fact that in different seasons and different epidemics, certain remedies will act well; while the next season or epidemic an opposite result will be attained with that very same remedy. While he had been familiar with the neurotic theory of the disease, yet he could not endorse it as the true theory. He would rather hold to the old fashioned theory, that the first cause rests in the mucous membrane, the symptom pointing thereto being very well marked. Niemyer refers to the large quantity of thick viscid mucus which always precedes a paroxysm of coughing, which when thrown off relief follows. And while he would hold to these old theories, he would also cling to the use of old fashioned remedies, believing that as good results may be attained by their use as by the more recent therapeutical transplantations. Still he had sometimes found good from the administration of the more recent remedies. He advocated hygienic measures, such as an abundance of good wholesome air, good food, etc.

Dr. Hamrod had recently been treating his cases with carbolic acid. He had also used quinine, and the asafœtida, ether and simple syrup mixture. He would like the theory of Dr. Powell referred to a committee in one of the dispensaries with instructions to report back to the society.

Dr. Charles M. Allin thought that the multiplicity of remedies and theories as to the nature of the disease, and plans of treatment, is indicative of the unsettled condition of the ideas of physicians in regard to the disease. He did not look with favor upon the plan of taking children suffering with the disease out in the fresh, raw air. The cold atmosphere reflects its injurious influence upon the tender mucous membrane.

Dr. Hammond also, referred to the multiplicity of the theories and remedies of this disease. The several cases which he had seen interested him more in regard to their cerebral complications. He had seen three cases which occurred in the interval of the paroxysms—when there was no cough during

the accession of the cerebral symptoms. There was no post mortem examination. He thought that lately it has been the habit of referring almost everything to bacteria. He did not think whooping-cough was of neurotic origin. It originates, in his opinion, primarily in the mucous membrane.

Dr. Allin remarked further, that he was in the habit of diagnosing whooping-cough not by the presence of suffused eyes and other symptoms of a catarrhal nature, but from their absence. A severe paroxysmal cough without catarrhal symptoms, or any other apparent adequate cause, is pretty sure to be pertussis.

ART. VI.—ON MIGRAINE.

BY J. L. TEED, M. D., KANSAS CITY, MO.

BY migraine is meant a deep seated pain, located in the forehead, the temples, the eyes, and the anterior parts of the scalp, rarely in the occiput; most frequently of a severe aching character, though sometimes throbbing or lancinating; often accompanied by heat and soreness of the integuments, and of the eyeballs; aggravated by the upright position, movement, light, and noise; often attended by disorders of vision, as blindness of one eye, partial blindness of both eyes, shimmering of the air, the "fortification outline," etc., etc.; by disorder of the stomach, as loss of appetite, nausea, or vomiting; by a copious secretion of saliva; by constipation; by coldness of the extremities, and often of the general surface; and towards the close of the attack by a copious discharge of pale limpid urine; these attacks recurring at intervals, or induced by certain accidental circumstances, as unusual mental labor, or anxiety; over-fatigue; exposure to cold wind; too long abstinence from food followed by a hearty meal; exposure